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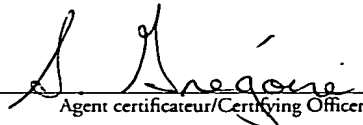
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Specification and Drawings, as originally filed, with Application for Patent Serial No:
2,203,591, on April 24, 1997, by **DIGITAL SECURITY CONTROLS LTD.**, assignee of
John Peterson and James Parker, for "Home Automation and Security System Controller".

PRIORITY DOCUMENT


Agent certificateur/Certifying Officer

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TITLE: SECURITY SYSTEM WITH INFORMATION DISPLAYFIELD OF THE INVENTION

5 The present invention relates to a security system and in particular, to a security system having the capability of displaying selected information not directly related to the operation of the security system.

10 BACKGROUND OF THE INVENTION

Security systems are becoming widespread in use with most commercial establishments and many residential establishments having security systems installed. Such security systems generally include a control panel which
15 controls the overall operation of the system, one or more keypad controllers for user access to the system and various detectors and sensors. The control panel is generally mounted in an area of restricted access, such as a utility room or basement, and contains the system
20 electronics, back-up power sources, and includes an interface for remote monitoring and two way communication over telephone lines or other systems. Security systems are generally divided into several zones or areas of protection and each of these zones generally has one or
25 more detection devices or sensors such as motion detectors, door or window contacts, glass break detectors, or shock sensors connected to it. In some security systems, smoke detectors or other fire detection devices may also be connected to the control panel.

30 Security systems generally have one or more keypad controllers which are used by the user to instruct the security system. The keypad controller is used to send commands to the system to control the operation of the
35 system and may also display system information. Such keypad controllers generally have a status display which may include either individual indicators, such as light

emitting diodes or may include a LCD or LED display, which is capable of displaying a number of alpha-numeric characters used to display simple messages regarding the status and operation of the system.

5

The control panel of a security system includes a microprocessor and sufficient memory for the security application. At certain times for example during communication of an alarm event or during check-in with a remote security monitoring station, the system utilizes most or all of these processing capabilities. At other times, the processing capabilities of the system are less active.

15 SUMMARY OF THE INVENTION

The present invention, is directed to a security system which, in addition to its normal function, acts as an information display for display of user selected information not directly related to the security system. Such information may include weather information, news reports, sports information, financial information, E-mail summaries, voice mail summaries, and personal reminders and calendar information. The display of such information is preferably under user control and is selectable to be customized for each individual user. The security system includes an interface means for communicating with a data access provider for retrieval of the user selected information for display on the keypad controller. This information is updated frequently in a communication between the data access provider and the security system.

In a preferred embodiment of the present invention, the keypad controller for controlling the function of the security system includes a graphical interface comprising a display screen capable of displaying a graphical representation of the security system and the components on the screen.

BRIEF DESCRIPTION OF THE DRAWINGS

5 Preferred embodiments of the present invention are illustrated in the attached drawings, wherein:

Figure 1 is a schematic view of a security system, embodying the concept of the present invention;

10 Figure 2 is a perspective view of a preferred embodiment of a controller for the security system of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

15 A typical security system according to the present invention is illustrated in Figure 1. Security system comprises a control panel 10 which controls the operation of the overall security system. A number of detection devices 12, utilized for monitoring a zone or area of protection, are connected to the control panel in a typical
20 manner. Detection devices 12 may be any of the commonly utilized detection devices such as motion detectors, door contacts, glass break detectors, shock sensors, fire detectors, water detectors, etc. The detection devices 12 in Figure 1 are shown hard wired to the control panel 10,
25 however, wireless technology is in common use and any of the detection devices 12 could use wireless communication between the detection devices 12 and the control panel 10. The security system reports to a remote monitoring station 14, utilizing any of the commonly employed methods of
30 communication such as utilizing a telephone dialer sending messages to the remote monitoring station 14 using local telephone systems 16. In some situations, the connection between the control panel 10 and the remote monitoring location 14 may also be wireless, utilizing cellular
35 telephone technology or other means of wireless communication. The system can also use other communication arrangements such as two way cable systems. A keypad

controller 20 is also connected to the control panel 10 for allowing the user to interface with the security system, to program the system and control the operation of the system and for displaying the status of the system and its various components.

The security system of the present invention can display user selected information not directly related to the operation of the security system. Such information may include, for example, current weather, news headlines, sports or stock markets quotes, etc. In this system, the security system cooperates with a data access provider 40 through a suitable interface module associated with the control panel 10. The interface module includes communication arrangements for communicating with the data access provider 40 and preferably also contains sufficient memory for storage of the user selected information obtained from the data access provider 40 for display on the keypad controller 20. The interface module may also include means for controlling the communication between the security system and the data access provider 40.

The interface module may utilize the components of the control panel 10 used in communication with the monitoring service for communicating with the data access provider 40 or the interface module may be provided with separate communicating arrangements independent of the monitoring service communication components. In those situations where the keypad controller 20 displays only one or more lines of alphanumeric characters, such a system could utilize the monitoring service communication components. Typically, monitoring service communication components utilize a relatively slow communication link, on the order of 1200 baud or less, as the information being communicated between the security system and the monitoring service is small in size. Such a communication rate is acceptable for the communication between the keypad

controller 20 and the data access provider 40 as the information can be communicated when convenient and stored in memory for recall by the user. If the information being communicated includes graphical components, then more
5 memory and possibly a higher speed modem may be required. In these situations, a higher speed modem, for example a 9600 baud or greater modem may be provided as part of the interface module. It is also desirable for the keypad controller 20 to have an input/output connection to enable
10 the user to down load the information to a personal organizer or other device. This connection could also enable the user to use the personal organizer or other device to enter personal information in the system or could be used to program the system as to the type of information
15 to be displayed.

In one embodiment of the present invention, the data access provider 40 is an Internet Service Provider (ISP) at which the user maintains an account. If the data
20 access provider 40 is an ISP, the interface module would include the required information for retrieving the desired information from the relevant sources of the information. For example, the interface module could include the means for establishing a link to a weather information service or
25 news information provider, the means for querying the service for the desired information and retrieving such information, and the means for packaging the information for display on the keypad controller 20. The interface module would also have a means for allowing the user to
30 program the interface module to specify the type of information they wish to receive as well as the sources of such information. This programming of the module could be accessible through the keypad controller 20 by selecting from menu items in a programming mode for the interface
35 module or the programming may be accomplished by other means, such as by the installer of the system, through the monitoring service or through the connection with a

personal organizer. The communication between the interface module and the information service could utilize any of the protocols associated with the Internet. For most information providers, the communication would likely
5 utilize Telnet or HTTP protocols utilizing a suitable Telnet or text based HTTP client, however, other protocols could be utilized if desired or necessary.

10 In another embodiment, the data access provider 40 may be a value added service either directly accessible by modem link or accessible through the Internet. In this situation, the data access provider 40 would have the required information available for retrieval by the user utilizing a protocol or method which provides for rapid
15 communication of the information for display on the keypad controller 20.

If the data access provider 40 is a value added service, the data access provider 40 would preferably have
20 a user profile for each individual location or establishment at which keypad controllers 20 are located. For locations at which there are multiple users, the data access provider could have a user profile for each individual user for the location. This user profile would
25 be selectable and programmable by the user such that they could select the specific types of information which they wish to have displayed on the keypad controller 20, as well as for some situations, the times for display of such information. For example, a user could program their user
30 profile to have the current weather conditions and weather forecast available for display on the keypad controller 20 from the time they normally rise in the morning until the time they would normally leave their home to go to work.

35 The data access provider 40 would retrieve the desired information from the required sources and repackage the information for transmission to the security system of

the user. Thus the data access provider 40 may access news, sports, business information, stock market quotes, weather, etc. information sources to provide the information requested by the user in their profile. The relevant information may be retrieved from commercial or other database providers 42 either by a direct link access or the database providers 42 may be accessed through the Internet using any of the commonly employed methods or protocols. Some sources may be accessed through the World Wide Web (WWW) using a suitably configured web browser. Other sources may be accessed by Telnet, Gopher, FTP or E-mail, depending upon the access method necessary for retrieving the information from the database provider 42. When utilizing protocols other than the HTTP protocol used on the WWW, the database provider 42 may be accessed by the enhanced capabilities of Web Browsers or by applications separate from a Web Browser.

Once the information is retrieved by the data access provider 40, it is repackaged in a form suitable for transmission to the security system for display on the keypad controller 20. The repackaging required would depend upon such factors as the format of the data, the amount of the data, whether the information is to be abstracted or highlighted, the way the data is to be displayed and other factors which would be apparent to those skilled in the art. Once the information is repackaged in the desired format, it is transmitted to the security system for storage and subsequent display when requested by the user. Depending upon such factors as the type and amount of information to be displayed, the type of keypad controller 20 and the user's desired preferences, the information displayed on the keypad controller 20 may first present a menu of topics from which the user can select to display further information on a particular topic. For example, a menu list giving the types of information such as news highlights, weather, sports

scores, etc. may be initially displayed. The user could then select one of the items from the list and either a further user selectable sub-menu may be displayed or the information for the topic itself may be displayed. The
5 information could be displayed line by line, such that one line of information is displayed for sufficient time for the user to read the information. The keypad controller 20 would, after the selected time, display the next line of information. Alternatively, the keypad controller 20 may
10 display the information in its entirety by scrolling through all of the information in a topic. The scrolling rate of the display would be such as to enable the user to read and comprehend the information displayed. When the keypad controller 20 is configured to present the
15 information by scrolling, some of the keys on the keypad controller 20 may be programmed to enable the user to pause, advance, back up or fast forward the scrolling if they wished to skip over some information, or view some information for a longer time such as for example to make
20 written notes of the information. A scrolling display could also be used to present all of the information continuously without the use of menu items. In these situations, the keypad controller 20 could scroll through all of the information and once the end of the information
25 has been reached, it could commence again at the beginning. Thus, the keys of the keypad controller 20 can function in a different manner relative to the operation in a security mode.

30 Depending upon the capability of the keypad controller 20 and/or interface module, the information to be displayed may be downloaded and stored in the interface module or keypad controller 20 for display at a later time or the information may be displayed live during the
35 connection with the data access provider 40. In the preferred embodiment, the interface module or keypad controller 20 is provided with sufficient memory and the

information from the data access provider is downloaded in its entirety and stored in the memory for display. In this situation, the user recalls from memory the stored information.

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If the interface module did not have sufficient memory for storing all of the information or were configured to maintain a live connection, the connection would be established and maintained based upon the instructions in the user profile. In this system, the user profile could instruct the data access provider 40 to retrieve the desired information and establish a connection with the user's security system at specified times set in the user profile. Alternatively, the times for the connection between the security system and the data access provider 40 could be programmed into the user's security system such that the system initiates the contact for downloading the information from the data access provider 40. For those times outside of the usual connection times set in the user profile, a means could be provided whereby the user could prompt the system to initiate a connection to the data access provider to retrieve and view the information.

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The information provided to the user is generally updated on a predetermined basis. The user could specify in their user profile the frequency of updating for each of the types of information. For example, the user could specify that they wished to have the weather information updated on a very frequent basis such as hourly or in shorter time frames. For less time critical information, such as sports scores, the updates could be less frequent, perhaps daily.

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In one embodiment of the present invention, the functions of the data access provider 40 may be provided as an additional service provided by the security system

monitoring service 14. In this type of setup, the communications between the data access provider 40 and the keypad controller 20 could use the same circuitry as the communication between the keypad controller 20 and the security system monitoring service 14. Often this is a proprietary system and therefore more desirable for use of integration. The security system monitoring service 14 could provide the information in the manner described above to the security system for display on the keypad controller 20. In addition, the security system monitoring service 14 would also perform its usual functions and could, while communicating with the keypad controller 20 to provide the user selected data, receive feedback on the status of the security system. If an alarm condition is detected in the security system, the control panel 10 of the security system immediately terminates the information display mode and switches to the functions of the security system in a conventional manner. This includes terminating any outside non-security communication, or if connected to the security system monitoring service 14, passing a signal causing the communication to assume the security mode.

The functions of the data access provider 40 and the security system monitoring service 14 may also be provided by different entities. For example, the dealer who installed the security system or the manufacturer of the keypad controller 20 could provide the services of the data access provider 40 as an additional service to the purchaser. In many locations, the dealers or manufacturers do not themselves provide the security system monitoring but use a central service to provide such functions to their customers. In these situations, the dealer or manufacturer could provide the data access provider services in the manner described above.

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Many security systems are configurable for multiple users, each of the users being assigned a personal

identification number (PIN) unique to them for the system. Such PIN's are used for arming and disarming the system as well as accessing the programming functions of the system. For such systems, information for different users of the security system can also be provided in a customizable manner. Upon entering their unique PIN number to disarm the security system, for example, the security system provides stored information for the particular user identified PIN for display on the keypad controller 20.

10 For example, a summary or note that E-mail or voice mail has been received could be displayed. Personal family calendars could also be available, either stored in the memory of the security systems or could be provided to the data access provider by E-mail, fax, etc. and then

15 selectively downloaded to the control panel for another particular day. Different calendars for different PINs can also be stored and displayed.

Upon leaving a premise, a user's PIN can be entered

20 to leave information such as expected return time, or location information. In this way, the keypad controller 20 can act as a note pad and family calendar.

As the primary purpose of the keypad controller 20

25 is the control of a security system, the keypad controller 20 would be programmed to give priority to the monitoring of the security system. The keypad controller 20 could be constantly monitoring the conditions of the detection devices 12 on a regular time interval, even when the keypad

30 controller 20 is displaying the user selected information. If at any time the keypad controller 20 detects the activation of any of the detection devices 12, then the keypad controller 20 would immediately cease the display of information and switch to the security system monitoring

35 and control functions.

In setups in which the data access provider 40 is separate from the monitoring service 14, the communications between the keypad controller 20 and the data access provider 40 may be distinct from the communications between the keypad controller 20 and the security system monitoring service 14, although, as set out above, some of the circuitry utilized for this communication may also be used for the communication with the data access provider 40. For example, security systems which communicate with a monitoring service 14 typically do so over the regular telephone system. These security systems are generally provided with a modem as part of the control panel 10 which is utilized for this communication. The modem circuitry for the communication with the monitoring service 14 could also be utilized for the communication with the data access provider 40. In these situations, the security system would be configured to drop any connection with the data access provider 40 when an alarm condition is detected to enable the immediate communication with the monitoring service 14. Alternatively, the communication path for communicating with the data access provider 40 may be provided with its own modem separate and apart from the modem for the monitoring service 14. Once again however if the security system detects an alarm condition while communicating with the data access provider 40, the keypad controller 20 would immediately drop the connection to enable the security system to communicate with the monitoring service 14. This would be preferred, even if the two modems were on separate telephone lines as it would be desirable that the keypad controller 20 would be dedicated to its primary function of security system monitoring and control functions in these situations.

The keypad controller 20 of the present invention may also be utilized in conjunction with the control panel 10 for controlling of home automation functions. Such home automation functions may include turning on and off

selected lights at selected intervals, and other typical functions normally associated with home automation. For example, the keypad controller 20 may be configured such that one of the function keys 30 or a code entered using the keypad may provide for access to home automation functions. Once the home automation function protocol is activated, then the selected home automation functions associated with a particular area of the establishment may be controlled through selection using the keypad. Thus, for example, a user could select a menu item and could program the turning on or turning off of a light in a selected area at selected times. Similarly, the system could be utilized to influence the environmental conditions within the establishments by setting temperature set points for varying the temperature within the establishment at selected times. Thus, for example, in a home environment, the user could program the system to maintain a relatively low temperature when no one is expected to be home and to program the system to increase the temperature just prior to the time when people are expected to arrive at the establishment.

In a preferred embodiment, the keypad controller 20 would also provide an interface to the utility services to monitor energy usage in the environment in which the controller is located. For example, in many locations, the meters utilized by utility services such as the electrical power or hydro service, water and gas services are provided with an interface to allow downloading of information to the utility service for billing purposes. The keypad controller 20 of the present invention could utilize this interface to provide the user with an indication of the user's usage of the energy source provided by the utility service. If the keypad controller 20 were also provided with the current rate schedule of each of the utility services, the controller could also display the cost of the services utilized.

Some security systems currently being manufactured are provided with audio or voice capabilities. Such systems may have intercom capabilities built in and in addition may have voice synthesis capability. With these systems, the user selected information may be transmitted to the user by audio means. For example, when the user prompts the keypad controller 20 for display of the information, the information could be communicated using a suitable text to speech conversion capability which could be provided as part of the security system. Additionally, in establishments having multiple users, the users could leave audio messages for one another. Such messages could be stored in the keypad controller 20 or interface module as a digital audio file for playback by the intended recipient of the message.

Figure 2 illustrates a perspective view of a preferred embodiment of a controller 20 for use in security systems of the present invention. As illustrated, controller 20 has a case 22 typically constructed of plastic for containing the components of the controller 20. On the front of the case 22, there is provided a window 24 in which a suitable graphic display 26 is located. Preferably, the graphic display is a LED or LCD display having a display resolution sufficient to permit readily discernible graphical and alpha-numeric information to be displayed thereon. Preferably, the display has a resolution of at least about 300 pixels horizontally and at least about 200 pixels vertically to enable the display to provide readily discernible graphical and alpha-numerical information. In the embodiment of the controller 20 as illustrated in Figure 2, the controller may be provided with a numeric key pad having numeric keys 28 typical of security system controllers. Controller 20 may also be provided with function keys or "hot" keys 30 for rapid access to various features of the controller 20.

The screen 26 of the controller 20 is preferably a touch sensitive screen whereby the operation of the security system may be controlled through touching of the screen 26 in the appropriate position. As illustrated in Figure 2, the controller 20 may be set up to display a floor plan of the establishment at which the security system is located. The display could be programmed to show the location of the various detection devices 12 of the security system and their status. Should a user wish further information on a detection device 12, in a particular location, or should they wish to program the functions of the security system with respect to the detection device 12, touching the screen 26 in the appropriate location could bring up a selection list to check or program the operation of the detection devices 12. Such selection list could be provided as a graphical menu overlay visible over the floor plan, or alternatively could be provided as a "hot" button list 32 displayed below the floor plan. Touching one of the menu items or buttons 32 in the hot button list would activate a command or provide further information on a detection device 12. Depending upon the function of the controller 20 selected on the touch screen 26, the options available on the hot button list 32 could be varied.

In a manner similar to that described above, the controller could also provide an interface to the utility services to monitor energy usage in the environment in which the controller is located.

The controller 20 of Figure 2 is also especially usable as an information display for display of user selected information as described above. The information repackaged in the desired format as described above, is transmitted to the controller 20 for display on the graphical display. Depending upon the type and amount of

information to be displayed as well as the user's desired preferences, the information displayed on the graphical controller may first present a menu of information which the user can select from to display further information on a particular topic. For example, a menu list giving the types of information such as news highlights, weather, sports scores, etc. may be initially displayed. The user could then select one of the items from the list and either a further user selectable sub-menu may be displayed or the information for the topic itself may be displayed. The information could be displayed screen by screen, such that one screen of information is displayed for sufficient time for the user to read the information. The controller would, after the selected time, display the next screen of information. Alternatively, the controller may display the information in its entirety by scrolling through all of the information in a topic. The scrolling rate of the display would be such as to enable the user to read and comprehend the information displayed. When the controller is configured to present the information by scrolling, a hot button could also be provided to enable the user to pause the scrolling if they wished to view the information for a longer time such as for example to make written notes of the information. A scrolling display could also be used to present all of the information continuously without the use of menu items. In these situations, the controller could scroll through all of the information that has been downloaded and once the end of the information has been reached, it could commence again at the beginning.

As the controller has a display capable of displaying graphical images, the controller could also aid in monitoring of the establishment at which the security system is installed. For example, video cameras could be provided at various locations and the controller could display the image seen by the camera on the graphical display. If there are a number of cameras located

throughout the establishment, the controller could display the images of each camera in sequence. Alternatively, depending upon the resolution of the graphical display screen and the capabilities of the system, the images from multiple cameras could be displayed in a split screen manner. If the user wished to see one of the images on full screen this could be selected by function key, a programmed key on the keypad, or by touching the desired image on the touch screen if the graphical display included a touch screen.

The user would also have the ability to select to display only the output of one camera for monitoring purposes. For example, if a camera were located at an entry point into the establishment, such as a door, the user could monitor the camera to identify any caller and decide whether or not to admit them into the establishment. Cameras located at strategic places within the establishment could also be used for accessing and monitoring alarm conditions. For example, establishments which have large cold rooms, such as walk in refrigerators, may have temperature sensors located in the cold area to monitor the temperature. Should the sensor detect that the temperature is outside the programmed range, an alarm condition is generated. In this situation, the user could examine the image displayed from the camera in the cold area, to attempt to determine the cause of the alarm condition.

Security systems using such camera monitoring could also be configured to pass the image of the camera to the monitoring service 14 in an alarm condition. Thus if the security system detects an alarm condition in a zone or area of the establishment in which a monitoring camera is located, the image of view of the camera in that location could be communicated to the monitoring service 14 as part of the communication of the alarm condition. Additionally,

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for those users having security systems in multiple locations, such as a homeowner who has a security system at their cottage, the security systems could be configured to communicate one with the other either by direct
5 communication or through the monitoring service. In this setup, if an alarm condition is detected at a location other than where the user was present, the notification of the alarm condition and the image of view of any camera located at the other location could be communicated to the
10 user.

The security system of the present invention provides enhanced services to the user of the security system, by providing for display of user selected
15 information at user selected times. The security system of the present invention helps users of the system in their daily life by providing timely and needed information, and helps in the planning of their daily activities.

The graphical controller of the preferred embodiment of the present inventions provides for enhanced capabilities of security systems using the controller as set out above. This controller is especially useful in the security systems having the capability of displaying user
20 selected information not related to the operation of a security system.
25

Although various preferred embodiments of the present invention have been described herein in detail, it
30 will be appreciated by those skilled in the art, that variations may be made thereto without departing from the spirit of the invention or the scope of the appended claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A security system capable of acting as an information display for display of user selected information not directly related to the security system, the security system comprising a control panel for controlling the operation of the security system, a keypad controller for communicating with the control panel and having a display capable of displaying information thereon, and an interface means for communicating with a data access provider for retrieval of the user selected information for display on the keypad controller.
2. A security system as claimed in claim 1 wherein the interface means includes a means for storing the information retrieved from the data access provider for recall for display on the keypad controller.
3. A security system as claimed in claim 2 wherein the interface means includes instructions for selecting sources of information and retrieval of information from the selected sources.
4. A security system as claimed in claim 3 wherein the data access provider is an Internet service provider.
5. A security system as claimed in claim 1 wherein the data access provider accesses other data sources for retrieval of the user selected information for communication with the security system.
6. A security system as claimed in claim 5 wherein the data access provider maintains a user profile including the other data sources for the user selected information.

7. A controller for controlling the function of components of a security system comprising a graphical display screen capable of displaying a graphical representation of the the components of a security system.

8. A controller as claimed in claim 7 wherein the graphical display screen is a touch screen, the function of the components of the security system being controllable by touching a portion of the screen having the component or security system to be controlled displayed thereon.

9. A controller as claimed in claim 8 wherein the controller also provides for control of home automation functions by providing a display of the environment conditions capable of being controlled in the home automation functions.

10. A controller as claimed in claim 7 wherein the controller also provides for display of user selectable information provided by a data access provider.

11. A controller as claimed in claim 10 wherein the user selectable information is one or more items selected from the group consisting of weather information, news reports, sports information, and financial information.

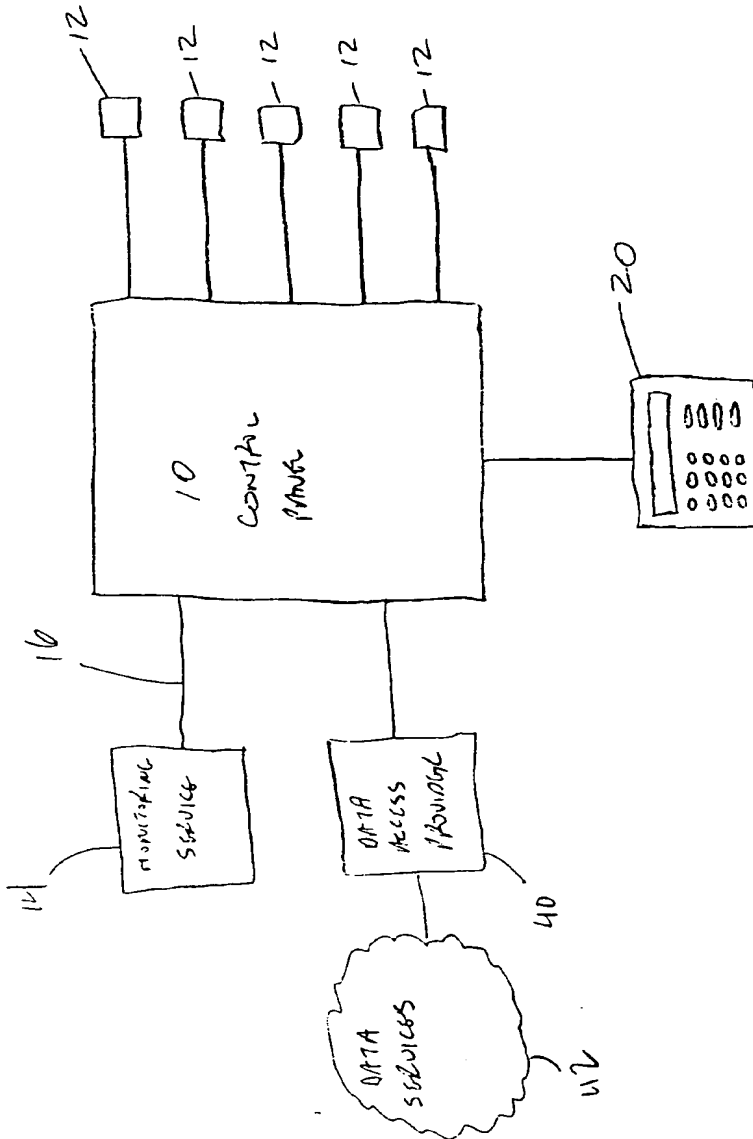


FIG. 1

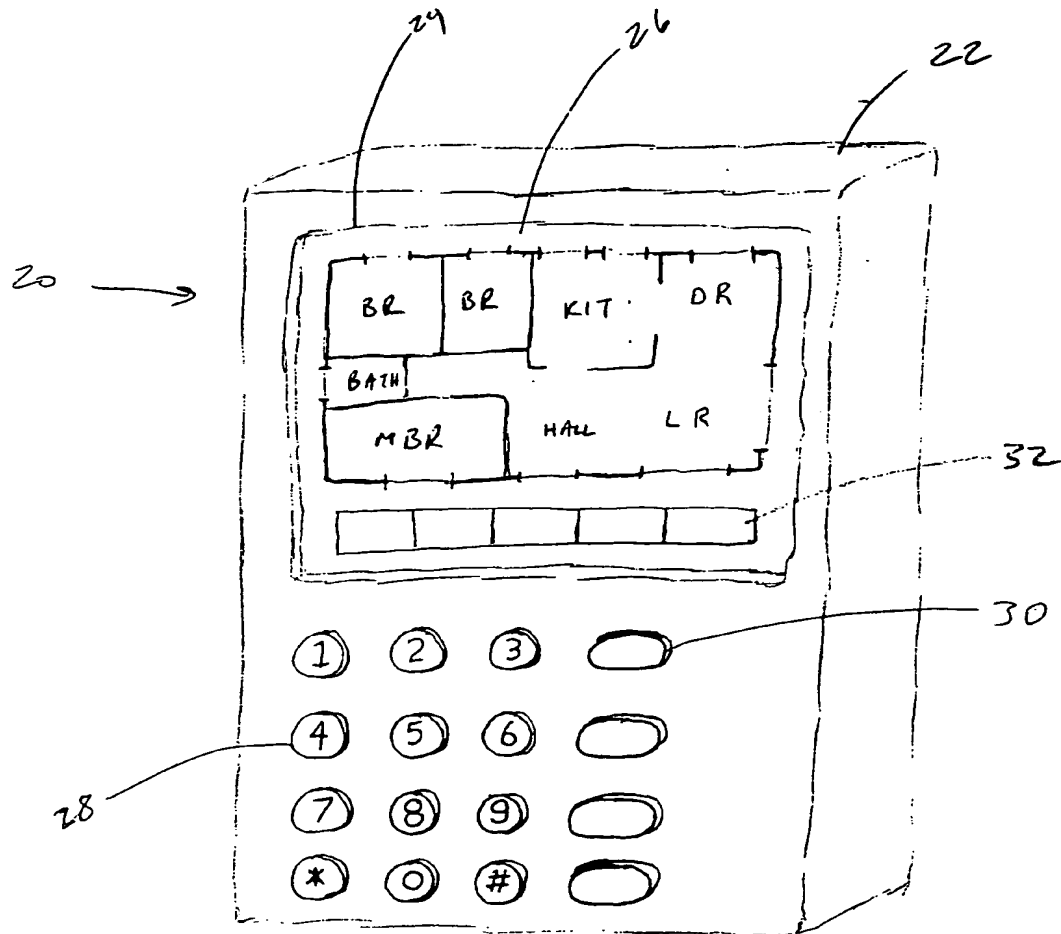


FIG 2.

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ABSTRACT OF THE DISCLOSURE

The present invention, in one aspect, is directed to a security system which is capable of acting as an information display for display of user selected information not directly related to the security system. Such information may include weather information, news reports, sports information and financial information. the display of such information is preferably under user control and is selectable to be customized for each individual user. The security system includes an interface means for communicating with a data access provider for retrieval of the user selected information for display on the keypad controller. In another aspect, the present invention is directed to a controller for controlling the function of components of a security system. The controller has a graphical interface comprising a display screen capable of displaying a graphical representation of the security system and the components on the screen and graphical representation of the user selected information. The graphical display may include a touch screen such that the function of the components of the security system are controlled by touching a portion of the screen having the component or security system to be controlled displayed thereon.

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